CROWN SERVICE MANUAL

ELECTRIC COUNTERTOP STEAMERS

MODELS: PX-3
PX-5



CROWN FOOD SERVICE EQUIPMENT LTD.
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GENERAL

INSTALLATION, OPERATION AND CLEANING

Refer to the Installation and Operation Manual for specific instructions.

NOTE: Daily cleaning is required.

<u>INTRODUCTION</u>

Features

- Requires no water or drain line connections (manual fill and manual drain).
- Cast aluminum “element block” for efficient heat transfer and distribution.
- Field convertible to single phase or three phase power.
- When wired for single phase, a reduced 2/3 power output is available.

Steam Cooking

The PX series steamer provides <u>timed</u> or <u>continuous</u> mode cooking in a “pressure-less” compartment. The small physical size of the steamer offers an efficient way to produce many foods in small batches. Pressure-less, convection steam cooking will steam cook fresh foods or will steam, defrost and cook frozen foods providing the maximum colour, flavour and nutritional value with the least expenditure of energy and labour. The “pressure-less” cooking compartment allows the operator to open and close the door, any time during a cooking cycle.

Model Designations

- PX-3 - 3 pan capacity*
- PX-5 - 5 pan capacity*

  * Based on 2.5 inch pan depth.

Exterior Dimensions

- PX-3 - 21" w x 25" d x 25" h*
- PX-5 - 21" w x 25" d x 31.5" h*

  * Includes 4" legs and 2" steam vent height.

SPECIFICATIONS

Water Requirements

Use “potable” tap water that meets the following specifications:

- Hardness of 2 - 3 grains (34 - 35 ppm).
- Total dissolved solids (TDS) less than 60 ppm.
- Ph factor of 7.0 to 7.5.

  These specifications can easily be obtained with the use of a properly maintained water softener.

- 2.5 gallons to fill holding pan (approximate).

Electric

MODEL	TOTAL kW	AMPERAGE PER LINE (60 HZ)[1]				
		3 PHASE[2]			1 PHASE[2]	
		208V	240V	480V	208V	240V
PX-3	9.0 STD.	25	21.7	10.9	43.3	37.5
	6.0[3]	-	-	-	28.9	25
PX-5	15.0 STD.	41.7	36.1	18.1	72.2	62.5
	10.0[3]	-	-	-	48.1	41.7
NOTES:	1. Amperage values in the table are nominal. Tolerance is +5/-10%. 2. All models are shipped for three phase connections. If a single phase connection is needed, the steamer is field convertible. Requires jumper wire changes at terminal block. See wiring diagram. 3. Field convertible to a reduced kW output (2/3 power connection). Requires jumper wire changes at terminal block. See wiring diagram.					

TOOLS

Standard

- Standard set of hand tools.
- Clear silicone sealant.
- VOM with an AC current tester (any quality VOM with a sensitivity of at least 20,000 ohms per volt can be used).
- Temperature meter and thermocouple.

Special

- Thermal Transfer Compound, Dow Corning 340, P/N 4917-1 or equivalent.

  NOTE: The additional tools below are required if replacing heating element assembly.

- Torque wrench (in - lb.)
- Tile Trowel 3/16" x 5/32" V notch.
- Loctite 271 or equivalent.

REMOVAL AND REPLACEMENT OF PARTS

COVERS AND PANELS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

Right Side Panel

1. Remove screws from bottom of panel.
2. Slide panel down to clear top cover.
3. Reverse procedure to install.

Top Cover

1. Remove screws from the top rear of cover.
2. Push up on rear of cover to clear steam vent pipe and slide forward to clear the front lip.
3. Lift the cover off the cabinet.
4. Reverse procedure to install.

Left Side and Rear Panel

1. Remove top cover as outlined under “TOP COVER”.
2. Disconnect electrical supply at terminal block.
3. Remove screws at bottom of panel.
4. Pull the combination left side and rear panel off.
5. Reverse procedure to install.

Lower Front Cover

1. Remove screws from the lower front cover.
2. Open the door, cut the bead of silicone at the top rear of cover then remove cover.
3. Clean silicone residue from mating surfaces.
4. Reverse procedure to install and apply silicone sealant at the top rear of cover.

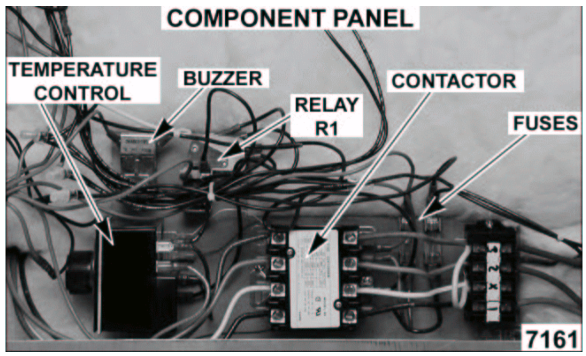
COMPONENT PANEL COMPONENTS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove right side panel as outlined under “COVERS AND PANELS”.
2. Disconnect lead wires to component being replaced.
3. Remove component.

COMPONENT PANEL COMPONENTS (Continued)

NOTE: If replacing temperature control, see "TEMPERATURE CONTROL CALIBRATION - ADJUSTMENT FOR ELEVATION" in "SERVICE PROCEDURES AND ADJUSTMENTS".



TIMER

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

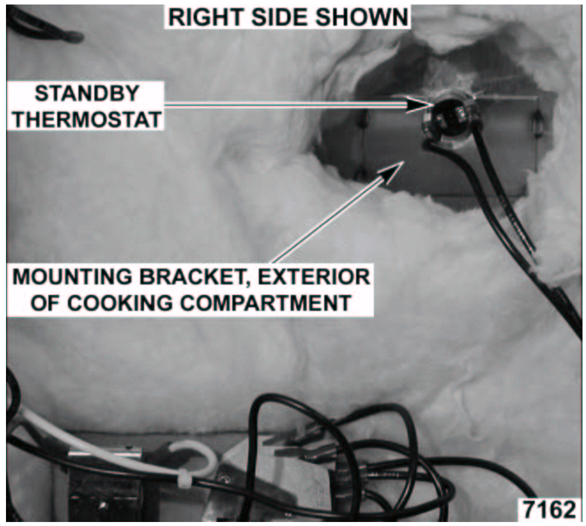
1. Remove right side panel as outlined under "COVERS AND PANELS".
2. Disconnect lead wires to timer.
3. Loosen two set screws on dial and pull timer knob from shaft.
4. Remove nut from timer shaft and remove timer.
5. Reverse procedure to install.

STANDBY THERMOSTAT

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove right side panel as outlined under "COVERS AND PANELS".
2. Pull insulation back to expose standby thermostat and disconnect lead wires.

STANDBY THERMOSTAT (Continued)



3. Grasp thermostat body and push up to slide holding tabs out from mounting bracket.

4. Apply a small amount of “thermal transfer compound” to the mating surface (disk side) of the replacement thermostat.

   A. Spread the compound completely and evenly over the surface of the thermostat.

5. Reverse procedure from step 3 to install and check steamer for proper operation.

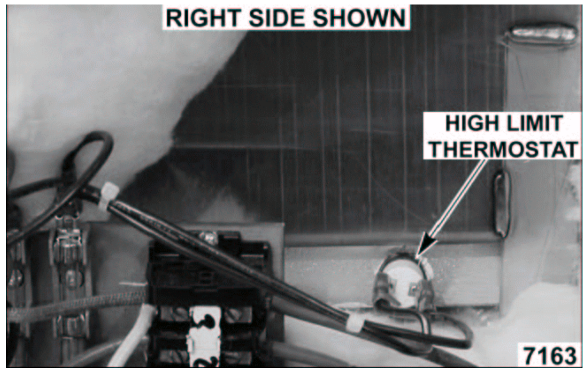
HIGH LIMIT THERMOSTAT

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove right side panel as outlined under “COVERS AND PANELS”.

2. Pull insulation back to expose high limit thermostat and disconnect lead wires.

HIGH LIMIT THERMOSTAT (Continued)



3. Remove thermostat from heating element assembly.

NOTE: Thermostat base is a brass 5/8" hex with a threaded stem.

4. Apply a small amount of “thermal transfer compound” to the mating surface (disk side) of the replacement thermostat.

   A. Spread the compound completely and evenly over the surface of the thermostat.

5. Reverse procedure from step 3 to install and check steamer for proper operation.

NOTE: Do not cross thread or over tighten the high limit or damage to the mounting threads may occur.

TEMPERATURE PROBE

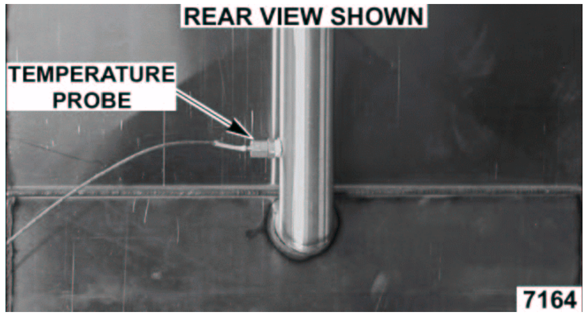
WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove all covers and panels as outlined under “COVERS AND PANELS”.

2. Disconnect probe leads from the temperature control.

3. Remove temperature probe from steam vent pipe.

TEMPERATURE PROBE (Continued)



4. Reverse procedure to install replacement probe.

5. Adjust temperature control as outlined under “TEMPERATURE CONTROL CALIBRATION” in ‘SERVICE PROCEDURES AND ADJUSTMENTS”.

HEATING ELEMENT ASSEMBLY

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

The heating element assembly contains three elements molded into a cast aluminum block. The block is mounted on the underside of cooking compartment.

NOTE: As the steamer is disassembled, remove the sheets of insulation from top, rear and left side, and the bottom. Retain insulation for use during re-assembly.

1. Remove all covers and panels as outlined under “COVERS AND PANELS”.

2. From the rear, tilt steamer until it rests on door.

   A. Place wooden blocks opposite door handle to level and support steamer.

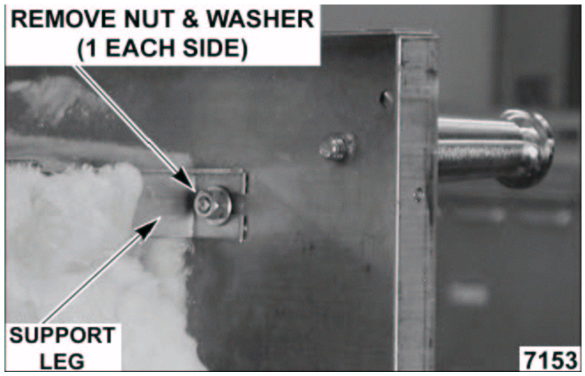
3. Grasp component panel and remove screws securing it to the base.

   A. Lower component panel and leave at the side of steamer so that all the component lead wires can remain connected.

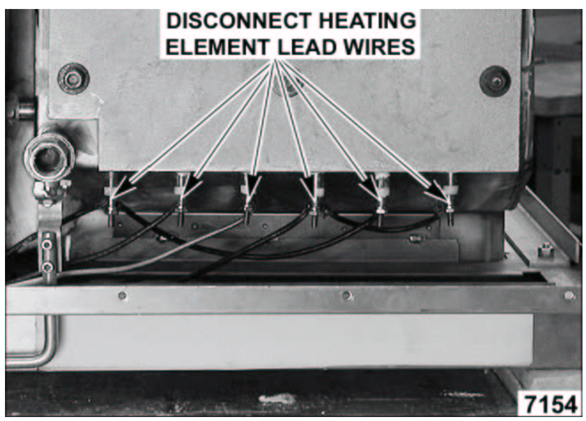
4. Remove screws securing base to steamer support frame.

5. Remove mounting nuts and washers from the rear cooking compartment support legs and remove base.

HEATING ELEMENT ASSEMBLY (Continued)

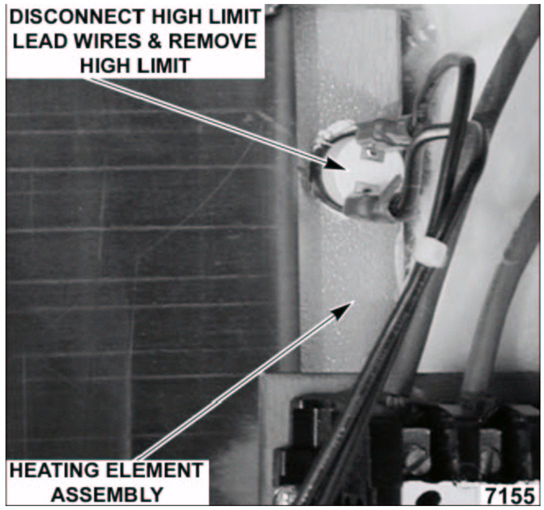


6. Disconnect heating element lead wires from element terminals.



7. Disconnect high limit thermostat lead wires and remove high limit from heating element assembly.

HEATING ELEMENT ASSEMBLY (Continued)



8. Remove heating element assembly from steamer by removing nuts and washers from mounting studs.

9. Clean Loctite residue from heating element assembly mounting stud threads.

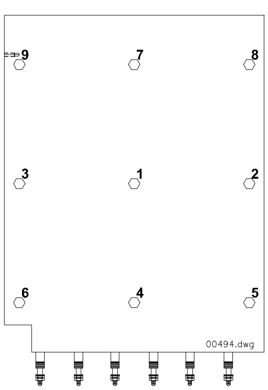
10. Apply approximately 4 oz. of heat transfer compound to the mating surface (side opposite markings) on the heating element assembly.

    A. Using a tile trowel, spread the compound evenly over the surface of the assembly.

11. Mount replacement heating element assembly to the underside of cooking compartment.

    A. Temporarily install a flat washer and nut on all mounting studs. **Hand tighten only.**

    B. Tighten each nut to 100 in-lb using the sequence as shown.



    C. Remove nut and washer from each mounting stud.

    D. Apply Loctite 271 to heating element assembly mounting stud threads.

    E. Stack two new spring disk washers (Belleville) together and install on each stud.

        1) Tighten each nut to 45 in-lb using the same sequence as shown.

12. Reverse procedure to re-assemble from step 7 and check steamer for proper operation.

MANUAL DRAIN VALVE

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

1. Remove all covers and panels as outlined under “COVERS AND PANELS”.

2. From the rear, tilt steamer until it rests on door.

   A. Place wooden blocks opposite door handle to level and support steamer.

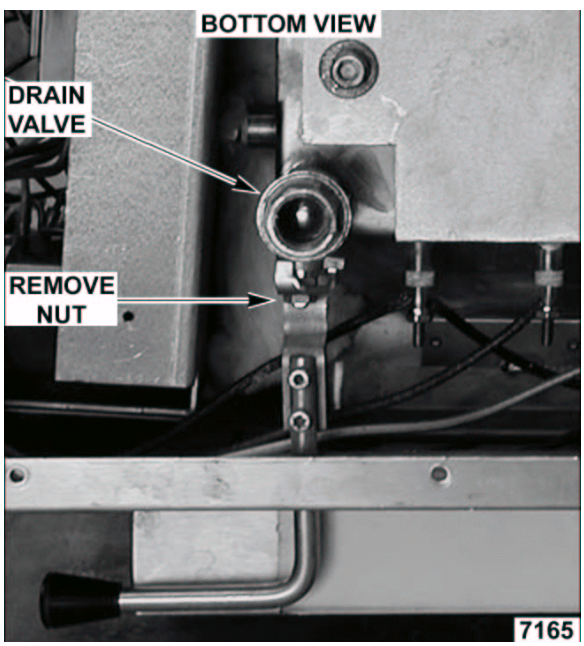
3. Grasp component panel and remove screws securing it to the base.

   A. Lower component panel and leave at side of steamer so that all the component lead wires can remain connected.

4. Remove screws securing base to steamer support frame.

5. Remove mounting nuts and washers from the rear cooking compartment support legs and remove base.

6. Remove outer nut on drain valve stem and lift off drain handle assembly.



MANUAL DRAIN VALVE (Continued)

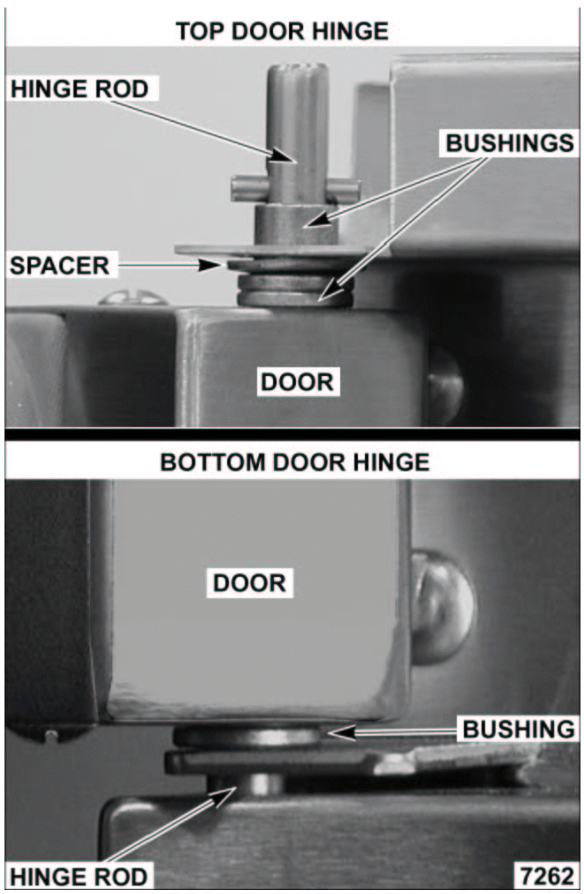
7. Remove manual drain valve from cooking compartment drain pipe.
8. Clean thread sealant residue from drain pipe threads and apply new sealant.
9. Install a replacement drain valve.
    A. Tighten valve body so that actuator stem is pointing towards front of steamer.
10. Reverse procedure to re-assemble from step 6 and check steamer for proper operation.

DOOR

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.

Removal

1. Remove top cover as outlined under “COVERS AND PANELS”.
2. Open the door.
3. Pull hinge rod up.
4. Reverse procedure to install, making sure the door bushings and spacer are in place.



DOOR (Continued)

Gasket

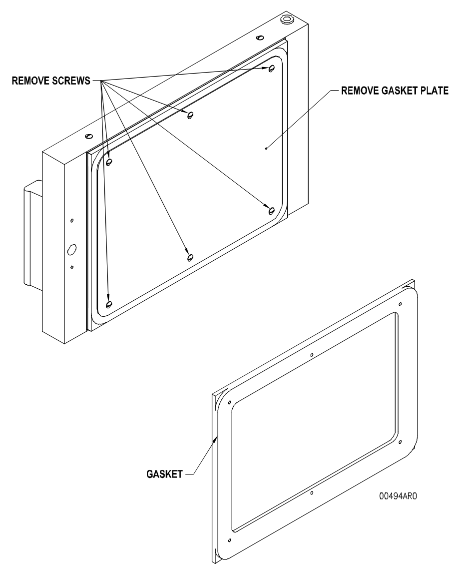
1. Open the door.

2. Remove screws from the gasket plate.

3. Pull the gasket plate out from the door housing and remove the gasket.

4. Position the new gasket on the gasket plate and reverse the procedure to install. Adjust the door as outlined under "DOOR SEALING ADJUSTMENT".

NOTE: Do not over tighten gasket plate screws as this will compress the gasket excessively and interfere with proper door sealing.



Handle

1. Open the door.

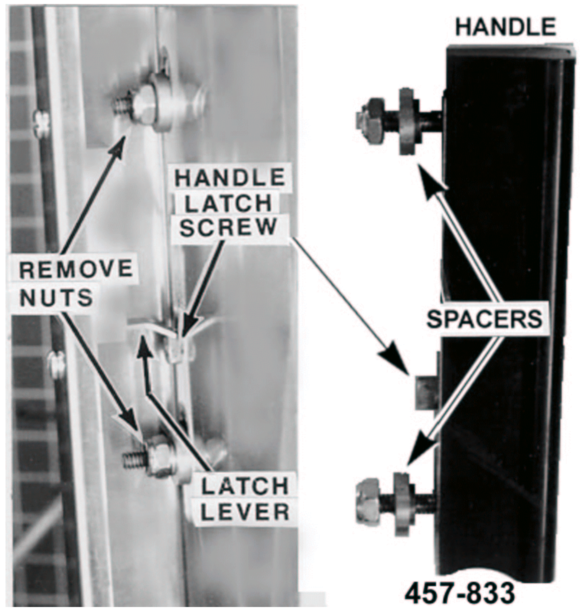
2. Remove screws from the top and bottom of the door.

3. Pull the "inner" door panel out from the door housing with the gasket plate and gasket still attached.

4. Remove the nuts and spacers from the handle screws and remove the handle from the door.

NOTE: When installing the spacers, the smaller diameter fits into the slot in the door and the latch lever must rest on top of the handle latch screw.

Handle (Continued)



5. Reverse procedure to install.

Latch Assembly

1. Open the door.
2. Remove screws from the top and bottom of the door.
3. Pull the “inner” door panel out from the door housing with the gasket plate and gasket still attached.
4. Remove the screws from the side edge of the door that secure the latch mechanism and remove the latch from the door.

Latch Assembly (Continued)



NOTE: When installing, the latch lever must rest on top of the handle latch screw.

5. Reverse procedure to install.

SERVICE PROCEDURES AND ADJUSTMENTS

WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.

DOOR LATCH ADJUSTMENT

Should the steamer door "jam" and cannot be opened, **DO NOT FORCE OR PRY** the door as damage will occur.

First, try lifting up on the bottom of the door at the handle end, to disengage the latch.

If that does not work, remove the right side panel. The striker that catches on the "door latch" is located behind the front face of the cooking cavity. Remove the nut from the striker. This will release it from the panel.

Once the nut and washer have been removed, door will open freely.

Remove any burrs on the striker that may cause the latch to stick.

Reinstall the striker and adjust, so door will not jam.

To adjust:

1. Reinstall he striker with the slot pointing upwards and "hand tighten" nut only.

2. Close the door to center the striker in the oval mounting hole.

3. Open the door and check the strikers' slot for horizontal alignment. The slot on the striker must be kept horizontal in order for the door latch to catch it properly and latch.

4. Once the proper slot alignment has been set, hold the striker close to its base using a rag and vise grips, then tighten the striker nut. Be careful not to damage the striker "slot" when tightening or door may not latch properly.

NOTE: Do not over tighten as the striker will begin to turn and change alignment.

DOOR SEALING ADJUSTMENT

On initial installation of new door gaskets, the door will be hard to close. This is required for proper gasket fit. As the door is used, it becomes easier to close after a few days.

1. Check the door gasket quality. If damaged or worn, replace as outlined under "DOOR".

2. Loosen screws until the screw heads no longer touch the gasket plate.

3. Tighten screws until screw head touches gasket plate and at that point begin counting turns.

Door Sealing Adjustment (Continued)

4. Tighten all screws approximately two turns.

5. Close the door and check unit for proper operation.

6. If necessary, tighten all screws an additional ½ turn and repeat step 5.

7. Repeat step 6 until the door closes properly and no steam "leaks" are seen around the gasket seal.

<u>HEATING ELEMENT TEST</u>

WARNING: THE FOLLOWING STEPS REQUIRE POWER TO BE APPLIED TO THE UNIT DURING THE TEST. USE EXTREME CAUTION AT ALL TIMES.

1. Turn cooking mode switch to "continuous".

2. Measure voltage at heating element terminals and verify it against data plate voltage.

   A. If voltage is <u>incorrect</u>, find the source of the problem.

   B. If voltage is <u>correct</u>, check current draw (amps) through the heating element lead wires.

NOTE: This method is preferred over a resistance check when a clamp on type amp meter is available.

   1) If current draw is correct then heating element is functioning properly. **See table below for proper values.**

   2) If current draw is <u>not</u> correct, turn cooking mode switch to OFF and **<u>disconnect the electrical supply</u>.**

      a. Replace heating element then proceed to step 3.

   C. If unable to check current draw, a resistance check <u>may</u> indicate a malfunctioning element.

   1) Turn the cooking mode switch to OFF and **<u>disconnect the electrical supply</u>**.

   2) Remove the lead wires from the heating element and check resistance (ohms). **See table below for proper values.**

3. Check for proper operation.

VOLTAGE	kW PER ELEMENT	AMPS PER ELEMENT		OHMS PER ELEMENT
		1 PH	3 PH	
208	3	14.4	8.3	14.4
240	3	12.5	7.2	19.2
480	3		3.6	76.8
208	5	24	14	8.7
240	5	21	12	11.5
480	5		6	46
NOTES:	1. Values in the table are nominal. Tolerance is +5/-10%. 2. Voltage values are @ 60 HZ. 3. Each heating element assembly contains 3 elements. Total kW would be the individual element kW times 3. 4. Resistance values (ohms) are at room temperature.			

TEMPERATURE CONTROL CALIBRATION

To set the temperature control for optimum steamer operation, the elevation above sea level for the service location <u>must</u> first be determined.

The elevation is used in conjunction with the elevation table below, to determine the correct set point temperature for the control.

NOTE: If the set point temperature is too high, the excess boiling action will cause water droplets to exit the steam vent pipe, and cause high water usage.

1. Remove right side panel as outlined under “COVERS AND PANELS”.

2. Place a thermocouple approximately one inch down in the center of steam vent pipe.

3. Turn steamer on by selecting “continuous” mode.

TEMPERATURE CONTROL CALIBRATION (Continued)

4. Allow steamer temperature to stabilize by completing two heating cycles.

5. Record the temperature reading when “heater” light goes out.

6. Using the elevation table, compare the recorded temperature to the temperature listed for the specific elevation.

NOTE: Use temperature scale on control for reference only. The scale represents dial turns in 1°F increments, not the actual temperature. When calibrating, use the recorded temperature taken from thermocouple.

ELEVATION (FT)	TEMPERATURE (°F)
Sea Level	210
1000	208
2000	206
3000	204
4000	202
5000	200
6000	198
7000	196
8000	195
9,000 or above	194

A. If the set point temperature of the control is correct, no adjustment is necessary.

B. If the set point temperature of the control is not correct, adjust the temperature control. Repeat step 4 until the correct temperature is achieved.

   1) Turn the temperature control dial clockwise to increase temperature or counterclockwise to decrease temperature.

ELECTRICAL OPERATION

COMPONENT FUNCTION

Buzzer .... Signals end of a "cook" cycle when cooking time expires.

Contactor .... Supplies line voltage to heating element assembly.

Relay R1 .... Supplies power to temperature control.

Transformer .... Provides 240V to the control circuit (480V only).

Heater Light (Green) .... Indicates steamer is heating.

Low Water Light (Red)....... Indicates additional water is required in cooking compartment.

Cooking Mode Switch (With Pilot Lights)............. Supplies 240V to the control circuit. Two internal "pilot" lights indicate the cooking mode selected. Timed mode is amber; Continuous mode is red.

Door Switch .... Removes control circuit power from steamer when door is opened.

High Limit Thermostat ..... Protects steamer by removing control circuit power if the heating element assembly temperature goes above 350°F (+/-15; 50°F differential).

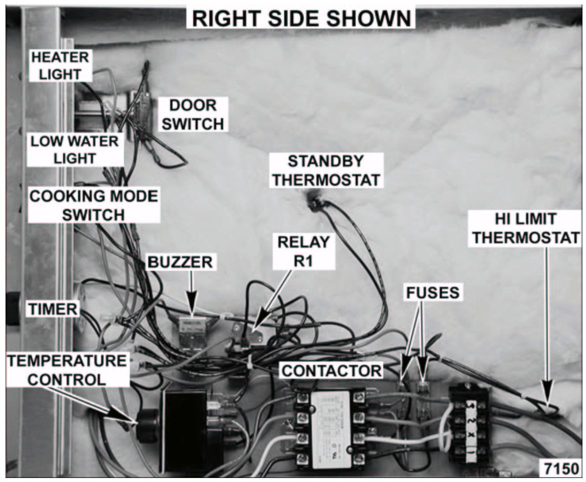
Temperature Control........ Monitors temperature probe and cycles power to heater contactor for steam generation.

Standby Thermostat.......... Maintains steamer at a standby temperature of 168°F (+5/-8) when "cook" timer is off (timed mode only).

Timer .... Counts "cook" time of product when time is dialed and energizes buzzer when time expires. To silence buzzer, dial must be turned to off.

Temperature Probe .... Senses cooking compartment temperature and sends a corresponding DC voltage back to the temperature control (J-type thermocouple).

COMPONENT LOCATION



SEQUENCE OF OPERATION

Wiring diagram will be used to explain the electrical sequence of operation.

Timed Cooking Mode

1. Conditions.

   A. Steamer connected to correct voltage and is properly grounded.

   B. Cooking mode switch (power) off.

   C. High limit thermostat closed.

   D. Standby thermostat closed.

   E. Temperature control is set up properly and is ready to use.

   F. Door closed (door switch closed).

   G. Timer “off”.

   H. Cooking compartment filled to the water level mark and below standby temperature of 168°F (+5/-8).

NOTE: At temperatures below 168°F, the steamer is in a “pre-heat” state.

SEQUENCE OF OPERATION (Continued)

2. Select “timed” on the cooking mode switch.
   - A. Internal “pilot” light (top, amber) comes on.
   - B. Internal “pilot” light (bottom, red) comes on.
   - C. Relay “R1" energized.
     - 1) R1-2A and R1-2B (both N.C.) open.
     - 2) R1-3A and R1-3B (both N.O.) close.
3. Temperature control energized and evaluates input from thermocouple.
   - A. With temperature below set point, internal relay contacts close.
     - 1) Heater light (green) comes on.
     - 2) Contactor energized and heating elements are powered.
4. Temperature reaches 168°F and standby thermostat opens.
   - A. Internal “pilot” light (top, amber) goes out.

   NOTE: Steamer will maintain standby temperature until a “cook” time is dialed on timer; or the cooking mode switch is turned to off or continuous; or the door is opened.

   - B. Relay “R1" de-energized.
     - 1) R1-2A & R1-2B return to N.C. position.
     - 2) R1-3A & R1-3B return to N.O. position.
       - a) Temperature control de-energized and internal relay contacts open.
       - b) Contactor de-energized and power removed from heating elements.
5. Set “cook” timer to desired time.
   - A. Timer contacts 1 and 3 close, timer motor is energized and timing down begins.

SEQUENCE OF OPERATION (Continued)

NOTE: Additional time can be set or the "cook" timer can be turned off throughout the cooking cycle. If turned to off, steamer reverts to standby temperature.

6. Temperature reaches set point and the temperature control's internal relay contacts open.

   A. Contactor de-energized and power is removed from heating elements.

7. Steamer cycles on the temperature control until "cook" time expires.

8. Time expires on "cook" timer.

   A. Timer contacts 1 and 3 open, timer motor is de-energized and timing stops.

   B. Timer contacts 1 and 4 close.

      1) Buzzer energized and sounds.

NOTE: The buzzer continues to sound until timer dial is set to off position or additional time is set.

9. Turn "cook" timer off.

   A. Steamer reverts to standby temperature and continues to cycle until a "cook" time is dialed on timer; or the cooking mode switch is turned to off or continuous; or the door is opened.

   NOTE: If water level becomes low during cycling, high limit thermostat will open and low water light (red) will come on.

Continuous Cooking Mode

1. Conditions.
   - A. Steamer connected to correct voltage and is properly grounded.
   - B. Cooking mode switch (power) off.
   - C. High limit thermostat closed.
   - D. Standby thermostat closed.
   - E. Temperature control is set up properly and is ready to use.
   - F. Door closed (door switch closed).
   - G. Timer “off”.
   - H. Cooking compartment filled to the water level mark and below standby temperature of 168°F (+5/-8).
2. Select “continuous” on the cooking mode switch.
   - A. Internal “pilot” light (top, amber) comes on.
   - B. Internal “pilot” light (bottom, red) comes on.
   - C. Relay “R1" energized.
     - 1) R1-2A and R1-2B (both N.C.) open.
     - 2) R1-3A and R1-3B (both N.O.) close.
3. Temperature control energized and evaluates input from thermocouple.
   - A. With temperature below set point, internal relay contacts close.
     - 1) Heater light (green) comes on.
     - 2) Contactor energized and heating elements are powered.
4. Temperature reaches 168°F and standby thermostat opens.
   - A. Internal “pilot” light (top, amber) goes out.

Continuous Cooking Mode (Continued)

NOTE: Standby thermostat does not affect continuous mode operation and the “cook” timer is not used.

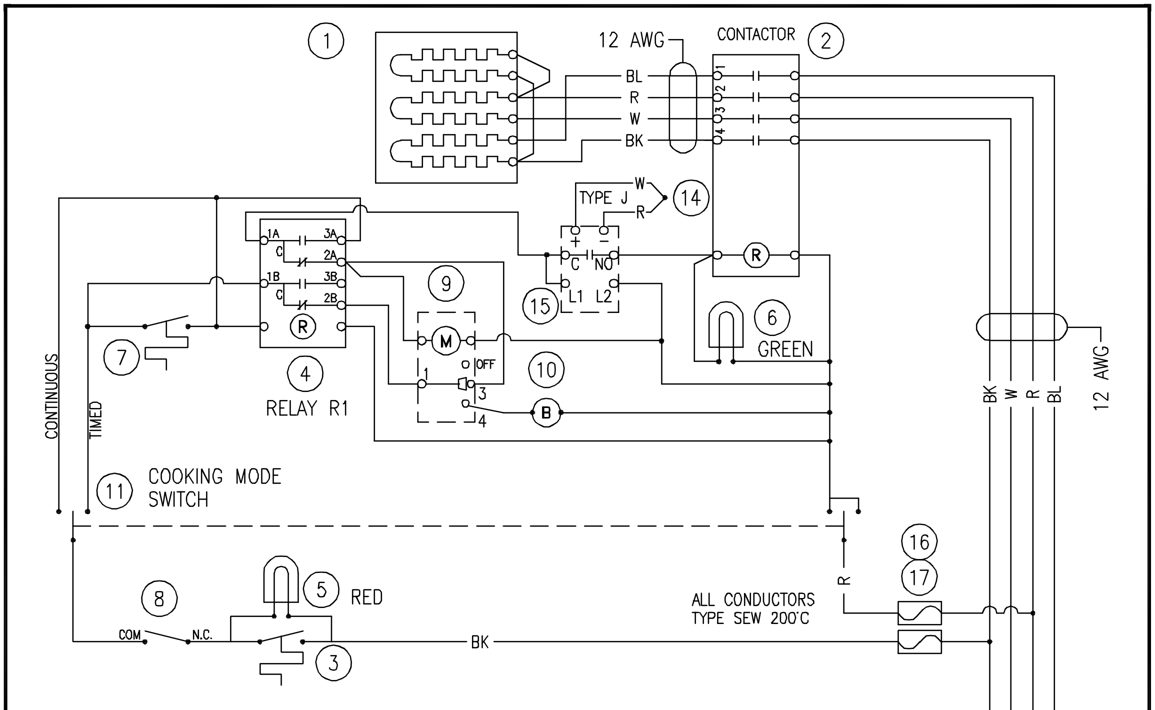
5. Temperature reaches set point and the temperature control’s internal relay contacts open.

    A. Contactor de-energized and power is removed from heating elements.

6. Steamer continues to cycle on the temperature control until the cooking mode switch is turned to off or timed; or the door is opened.

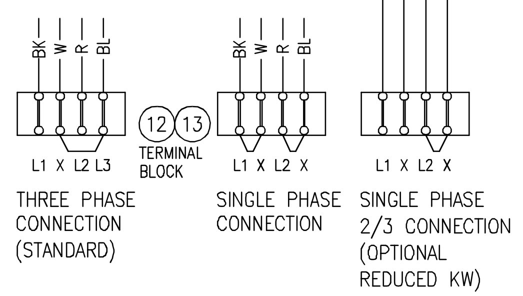
NOTE: If water level becomes low during cycling, high limit thermostat will open and low water light (red) will come on.

WIRING DIAGRAMS



*SELECT AS REQUIRED.

ITM	DESCRIPTION	PART NO.	QTY
*1	ELEMENT ASSEMBLY, 208V 9kW	6921-1	1
	ELEMENT ASSEMBLY, 208V 15kW	6921-6	1
	ELEMENT ASSEMBLY, 220V 9kW	6921-2	1
	ELEMENT ASSEMBLY, 220V 15kW	6921-7	1
	ELEMENT ASSEMBLY, 240V 9kW	6921-3	1
	ELEMENT ASSEMBLY, 240V 15kW	6921-8	1
2	CONTACTOR	4916-1	1
3	HIGH LIMIT THERMOSTAT, 350°F	4914-1	1
4	RELAY, DPDT	9-3174	1
5	PILOT LAMP, RED	4661-4	1
6	PILOT LAMP, GREEN	4661-6	1
7	THERMOSTAT, STAND-BY, 168°F	9077-1	1
8	SWITCH, SPDT, DOOR INTERLOCK	9-3213	1
9	TIMER, 60 MIN@60Hz	4-T209-1	1
10	BUZZER	4742-1	1
11	SWITCH, ON/OFF, DPDT	9124-1	1
*12	TERMINAL SECTION	4-22TB	4
	TERMINAL SECTION, 15 kW, 208-240V	4-33TB	4
*13	TERMINAL END PIECE	4-22ES	1
	TERMINAL END PIECE, 15kW, 208-240V	4-33ES	1
14	THERMOCOUPLE	9080-1	1
15	TEMPERATURE CONTROL	9143-1	1 △3
16	FUSE, 1A, 250V	9092-1	2
17	FUSE HOLDER	9068-1	2



AMPS			
Volts	1 PH @ 2/3	1 PH	3-PH
208-9	28.9	43.3	25.0
220-9	27.3	41.0	23.7
240-9	25.0	37.5	21.7
208-15	48.1	72.2	41.7
220-15	45.5	68.2	39.4
240-15	41.7	62.5	36.1

NO.	BY	DATE	DESCRIPTION
3	JD	4.13.04	ERN-789

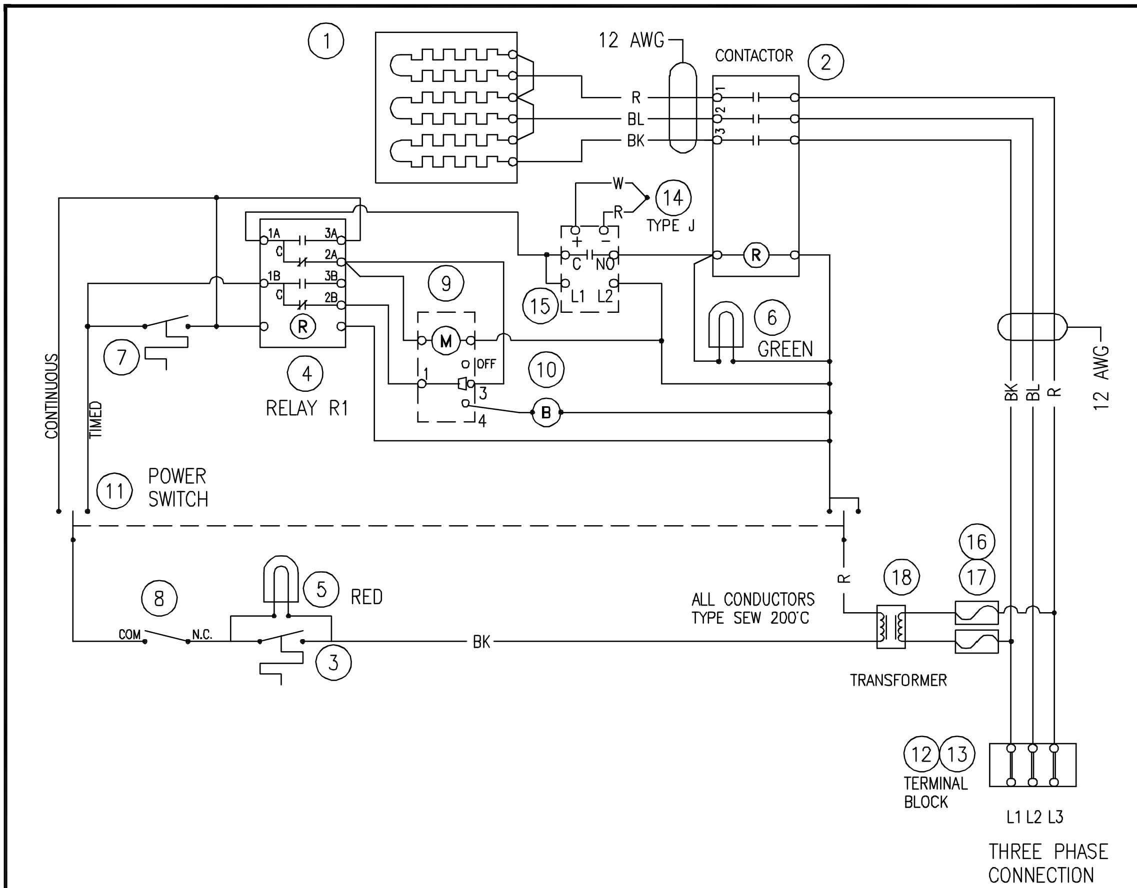
REVISIONS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
PROJECTION
DO NOT SCALE DRAWING

PART NO.		
SCALE	1:1	M.D.Y
DESIGNED		
DRAWN	JD	6.19.00
CHECKED		
APP'D		

CROWN FOOD SERVICE EQUIPMENT LTD.
VPX-3 & VPX-5
208V/220V/240V

DRAWING NO. 3E-15027 SIZE A REVISION 3



*SELECT AS REQUIRED.

ITM	DESCRIPTION	PART NO.	QTY	ITM	DESCRIPTION	PART NO.	QTY
*1	EL. ASM. 380V (220V)9kW, 13.7 A/PH	6921-2	1	9	TIMER, 60 MIN@60Hz	4-T209-1	1
	EL. ASM. 380V (220V)15kW, 22.8 A/PH	6921-7	1	10	BUZZER	4742-1	1
	EL. ASM. 415V (240V)9kW, 12.6 A/PH	6921-3	1	11	SWITCH, ON/OFF, DPDT	4-SA51D	1
	EL. ASM. 415V (240V)15kW, 20.9 A/PH	6921-8	1	12	TERMINAL SECTION	4-22TB	3
	EL. ASM. 480V (277V)9kW, 10.9 A/PH	6921-4	1	13	TERMINAL END PIECE	4-22ES	1
	EL. ASM. 480V (277V)15kW, 18.1 A/PH	6921-9	1	14	THERMOCOUPLE	9080-1	1
	EL. ASM. 600V (347V)9kW, 8.7 A/PH	6921-5	1	15	TEMPERATURE CONTROL	9143-1	1
	EL. ASM. 600V (347V)15kW, 14.5 A/PH	6921-10	1	*16	FUSE, 1A, [380V-480V]	9001-3	2
2	CONTACTOR	4-NG41	1		FUSE, 8/10A, [600V]	9001-5	2
3	HIGH LIMIT THERMOSTAT, 350°F	4914-1	1	17	FUSE HOLDER	9002-1	2
4	RELAY, DPDT	9-3174	1	*18	TRANSFORMER, 380/220, 100VA	4-T251	1
5	PILOT LAMP, RED	4661-4	1		TRANSFORMER, 415/240, 100VA	4-T251	1
6	PILOT LAMP, GREEN	4661-6	1		TRANSFORMER, 480/240, 100VA	4-T255	1
7	THERMOSTAT, STAND-BY, 168°F	9077-1	1		TRANSFORMER, 600/240, 100VA	4-T260	1
8	SWITCH, SPDT, DOOR INTERLOCK	9-3213	1				

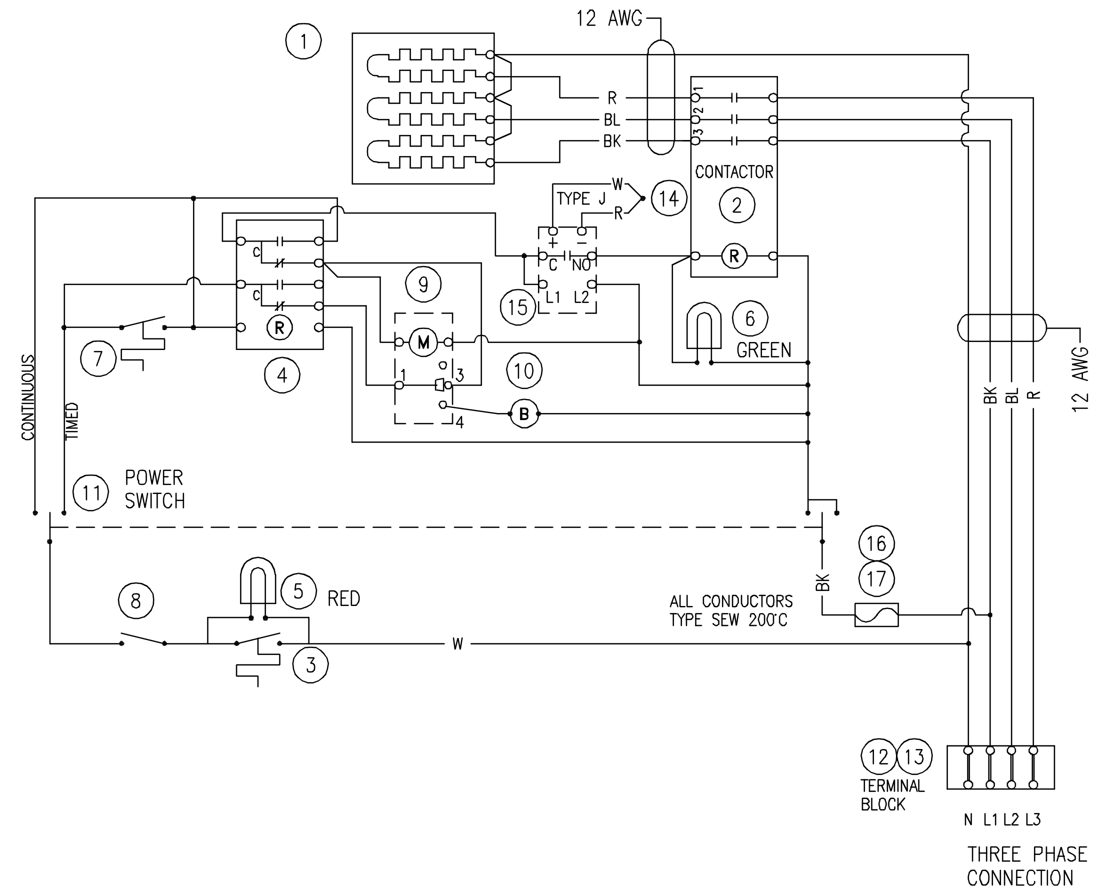
NO.	BY	DATE	DESCRIPTION

REVISIONS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
PROJECTION
DO NOT SCALE DRAWING

PART NO.
SCALE 1:1 M.D.Y
DESIGNED
DRAWN JD 8.10.00
CHECKED
APP'D

CROWN FOOD SERVICE EQUIPMENT LTD.
VPX-3 & VPX-5
380V, 415V, 480V, 600V
9kW & 15kW
DRAWING NO. 3E-15028 SIZE A REVISION 2



*SELECT AS REQUIRED.

ITM	DESCRIPTION	PART NO.	QTY	ITM	DESCRIPTION	PART NO.	QTY
*1	EL. ASM. 220V 9kW, 13.7 A/PH	6921-2	1	8	SWITCH, SPDT, DOOR INTERLOCK	9-3213	1
	EL. ASM. 220V 15kW, 22.8 A/PH	6921-7	1	9	TIMER, 60 MIN@60Hz	4-T209-1	1
	EL. ASM. 240V 9kW, 12.6 A/PH	6921-3	1	10	BUZZER	4742-1	1
	EL. ASM. 240V 15kW, 20.9 A/PH	6921-8	1	11	SWITCH, ON/OFF, DPDT	4-SA51D	1
2	CONTACTOR	4-NG41	1	12	TERMINAL SECTION	4-22TB	4
3	HIGH LIMIT THERMOSTAT, 350°F	4914-1	1	13	TERMINAL END PIECE	4-22ES	1
4	RELAY, DPDT	9-3174	1	14	THERMOCOUPLE	9080-1	1
5	PILOT LAMP, RED	4661-4	1	15	TEMPERATURE CONTROL	9143-1	1
6	PILOT LAMP, GREEN	4661-6	1	16	FUSE, 1A, 250V	4-FU04	1
7	THERMOSTAT, STAND-BY, 168°F	9077-1	1	17	FUSE HOLDER	9068-1	1

NO.	BY	DATE	DESCRIPTION

REVISIONS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
PROJECTION
DO NOT SCALE DRAWING

PART NO.
SCALE 1:1 M.D.Y
DESIGNED
DRAWN JD 8.16.00
CHECKED
APP'D

CROWN FOOD SERVICE EQUIPMENT LTD.
VPX-3 & VPX-5
380/220, 4-WIRE
415/240, 4-WIRE
DRAWING NO. 3E-15029 SIZE A REVISION 3

TROUBLESHOOTING

WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TESTS OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.

SYMPTOM	POSSIBLE CAUSES
Compartment leaks water around door.	1. Steamer not level. 2. Steamer overfilled.
Steam leaks around door.	1. Worn gasket. See “DOOR” in “SERVICE PROCEDURES AND ADJUSTMENTS’. 2. Damaged gasket. 3. Steam vent pipe blocked.
Steam generated inside compartment when timer is off.	1. Timer malfunction. 2. Contactor malfunction. 3. Temperature control malfunction (heater light on.)
Steamer will not heat (heat light off).	1. Line voltage incorrect. 2. Control circuit fuse(s) open. 3. High limit thermostat open (low water light on). 4. Door open or door switch malfunction. 5. Cooking mode switch off or inoperative. 6. Relay R1 malfunction. 7. Timer malfunction (timed mode only). 8. Temperature probe malfunction. 9. Temperature control malfunction.
Steamer will not heat (heat light on).	1. Line voltage incorrect. 2. Heating element malfunction. 3. Contactor malfunction.
Timer motor does not run.	1. Door open or door switch malfunction. 2. Relay R1 malfunction. 3. Timer inoperative.
Door not closing properly.	1. Door latch assembly. 2. Striker adjustment. 3. Steamer pan not inserted properly.

SYMPTOM	POSSIBLE CAUSES
Door won't open.	1. Latch won't release. See "DOOR LATCH ADJUSTMENT" in "SERVICE PROCEDURES AND ADJUSTMENTS".
Buzzer not operating.	1. Timer malfunction. 2. Buzzer malfunction.
Water spraying out of steam vent pipe during a "cook" cycle.	1. Temperature control calibration too high. See "TEMPERATURE CONTROL CALIBRATION - ADJUSTMENT FOR ELEVATION" in 'SERVICE PROCEDURES AND ADJUSTMENTS". 2. Temperature probe malfunction. 3. Temperature control malfunction. 4. Contactor malfunction.
High water usage.	1. Temperature control calibration too high. See "TEMPERATURE CONTROL CALIBRATION - ADJUSTMENT FOR ELEVATION" in "SERVICE PROCEDURES AND ADJUSTMENTS". 2. Temperature probe malfunction. 3. Temperature control malfunction. 4. Steamer operating in "continuous" mode.
Excessive or inconsistent "cook" times.	1. Door left open between loads. 2. Temperature control calibration too low. 3. Heating element malfunction. 4. Standby thermostat malfunction.

CONDENSED SPARE PARTS LIST

PX-3 and PX-5		
PART NUMBER	**DESCRIPTION**	**NOTES**
8-5063-8	**Door Gasket (PX-5)**	
8-5063-9	**Door Gasket (PX-3)**	
9-3213	**Door Switch**	
9143-1	**Thermostat - Temperature Control**	
9077-1	**Thermostat - Standby**	
9080-1	**Thermocouple Sensor, J-Type**	
9068-1	**Fuse Block**	
9092-1	**Fuse, 1 Amp., 250V (208/240V)**	
4916-1	**Contactor (208/240V)**	
4914-1	**High Limit Thermostat**	
9124-1	**Power Switch (Cooking Mode Switch)**	
38595	**Element Assembly, 208V, 9 kW**	
38600	**Element Assembly, 208V, 15 kW**	
38597	**Element Assembly, 240V, 415V, 9 kW**	
38602	**Element Assembly, 240V, 415V, 15 kW**	
38596	**Element, 220V, 380V, 9 kW**	
38601	**Element, 220V, 380V, 15 kW**	
38598	**Element, 480V, (277V), 9 kW**	
38603	**Element, 480V, (277V), 15 kW**	
38599	**Element, 600V, (347V), 9 kW**	
38604	**Element, 600V, (347V), 15 kW**	
4-T209-1	**Timer, 60 Minutes**	
9001-3	**Fuse, 1A, (380V - 480V)**	
9001-5	**Fuse, 8/10A, (600V)**	

PX-3 and PX-5		
PART NUMBER	**DESCRIPTION**	**NOTES**
9002-1	**Fuse Holder (380V - 600V)**	
4-NG41	**Contactor (380V - 600V)**	
4-T251	**Transformer, 380/415 - 220/240V, 100VA**	
4-T255	**Transformer, 480 - 240V, 100 VA**	
4-T260	**Transformer, 600 - 240V, 100 VA**	

Revision History

Revision	Revised By	Pages Affected	Effective Date	Comments
	Brian	All	Mar. 15, 2005	New Crown Service Manual. Originally created for Vulcan.

ALTERNATE PARTS

Page	Item	Crown	Blodgett	Southbend	Market Forge	Vulcan	Hobart

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CROWN FOOD SERVICE EQUIPMENT LTD.

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Models: VPX3, VPX5

HOBART

Models: HPX3, HPX5